Suisun Marsh Monitoring Program
Channel Water Salinity Report

Reporting Period: January 2009

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1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

As per SWRCB Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions, the California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. Conditions of channel water salinity in the Suisun Marsh are determined by monitoring specific electrical conductivity, which is referred as "specific conductance" (SC). The locations of all listed stations are shown in Figure 5.

The monthly reports are submitted for October through May each year in accordance with SWRCB requirements. The reports are required to include salinity data from the stations listed below to ensure salinity standards are met to protect habitat for waterfowl in managed wetlands:

Station Identification	Station Name	General Location	Classification
C-2*	Collinsville	Western Delta	Compliance Station
S-64	National Steel	Eastern Suisun Marsh	Compliance Station
S-49	Beldon's Landing	North-Central Suisun Marsh	Compliance Station
S-42	Volanti	North-Western Suisun Marsh	Compliance Station
S-21	Sunrise	North-Western Suisun Marsh	Compliance Station

Data from the stations listed below are included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh.

Station Identification	Station Name	General Location	Classification
S-97	Ibis	Western Suisun Marsh	Monitoring Station
S-35	Morrow Island	South-Western Suisun Marsh	Monitoring Station

Information on Delta outflow, area rainfall, and operation of the Suisun Marsh Salinity Control Gates are also included in the monthly reports to provide information on conditions that may affect channel water salinity in the Marsh.

* Throughout the report, the representative data from nearby USBR station is used in lieu of data from station C-2.

2. Monitoring Results

2.1 Channel Water Salinity Compliance

During the month of January, 2009, **deficiency standard apply and salinity conditions at only two compliance stations (i.e. S21 and S42)** are in compliance with channel water salinity standards of SWRCB (Table 1). Compliance with standards for the month of January was determined for each compliance station by comparing the progressive daily mean of high-tide SC with respective standards. The standard for compliance stations S-21 and S-42 was 15.6 mS/cm during January 2009. Table 1 lists monthly mean high-tide SC at these compliance stations. The progressive daily mean (PDM) is the monthly average of both daily high-tide SC values. The mathematical equation is shown below.

$$\text{PDM} = \frac{\sum \text{daily average of high tide SC}}{\text{\# days of the month}}$$

2.2 Delta Outflow

Outflow for January 2009 started off extremely low at about 4,000 cfs and continued to be low for most of January as shown in Figure 3. It was not until late January when there were a few precipitation activities which resulted outflow to increase and peaked slightly above 14,000 cfs for a short time before dropping down to about 9,000 cfs at the end of the month. Outflow is represented by the mean Net Delta Outflow Index (NDOI). The NDOI is the estimated daily average of Delta outflow. Mean NDOI for January 2009 is listed below:

Month	Mean NDOI (cubic feet per second)
January	6,538

2.3 Rainfall

There were two precipitation events at the beginning of January, but most were at the later half of the month. Most of the daily rainfall events were less than 0.4 inches and the largest precipitation was less than 0.7 inches as shown in Figure 3. Overall, the monthly total rainfall amount was lower than previous monthly total. The monthly total is shown below:

Month	Total Rainfall (inches)
January	1.55

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during January 2009 is summarized below.

Date	Gate status	Flashboards status	Boat Lock status
January 1 – 15	3 Open	In	Open
January 16 – 31	3 Tidally operate	In	Open

The gates were not operated at the start of January 2009; however, due to salinity concern by mid-month, gate operations resumed on January 16 and lasted for the remainder of the month.

3. Discussion

3.1 Factors Affecting Channel Water Salinity in the Suisun Marsh

Factors that affect channel water salinity levels in the Suisun Marsh include:

- delta outflow;
- tidal exchange;
- rainfall and local creek inflow;
- managed wetland operations; and,
- operations of the SMSCG and flashboard configurations.

3.2 Observations and Trends

3.2.1 Conditions during the Reporting Period

During January 2009 PDM salinity levels at Collinsville(C-2), National Steel(S-64), Beldons (S-49), and Volanti(S-42) ranged between 4.0 mS/cm and 14.0 mS/cm as shown in Figure 1. With the exception of Collinsville, salinity levels at all stations were stable for most of the month until gate operations resumed in mid-January. Thereafter, S64 and S49 salinity dropped off slowly and is also seen at S21 and S42, but to a lesser magnitude due to the proximity of the stations to the gates. At control stations, S35 and S97, salinity levels were essentially stable throughout the month as shown in Figure 2. Gate operations do not effect salinity that far to the west. Overall, salinity levels were below the monthly standard of 15.6 mS/cm.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for January 2009 were compared with means for those months during the previous nine years (Figure 4).

Mean salinity pattern of all compliance and monitoring stations does not resemble any of the previous year levels. Compared to previous nine years, January 2009 salinity levels overall were ranked first in high Specific Conductance. Unlike past years, the higher salinity for January 2009 is probably a result of extremely dry hydrologic conditions along with reduced gate operations for fish concerns.

Table 1

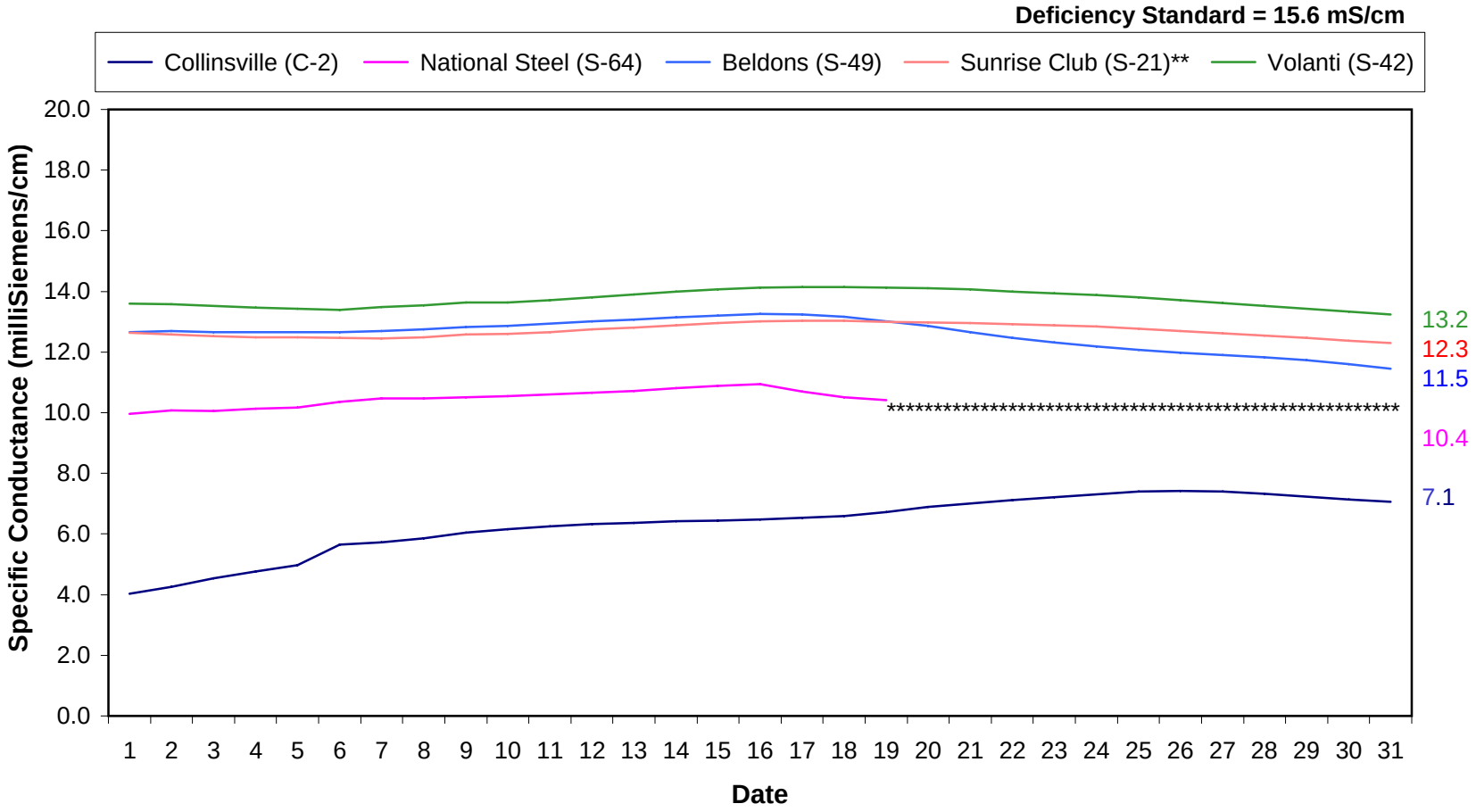
Monthly Mean High Tide Specific Conductance at Suisun Marsh Water Quality Compliance Stations

January 2009

Station	Specific Conductance (mS/cm)*	Deficiency Standard	Deficiency Standard meet?
C-2**	7.1	n/a	n/a
S-64	10.4	n/a	n/a
S-49	11.5	n/a	n/a
S-42***	13.2	15.6	Yes
S-21***	12.3	15.6	Yes

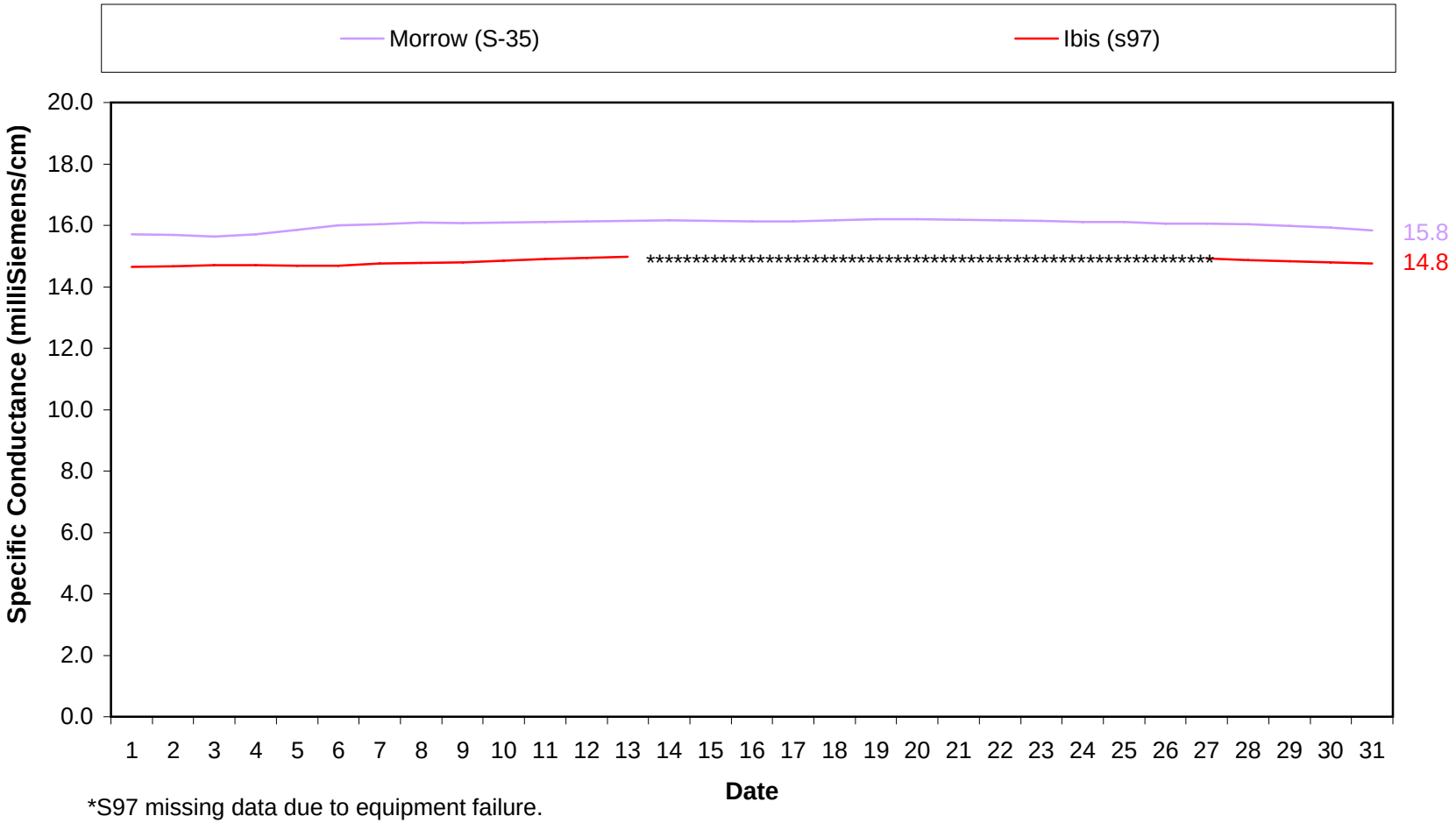
*milliSiemens per centimeter
**The representative data from nearby USBR station is used in lieu of data from station C-2.
***As define in D1641 and RSMPA, monthly standard only apply to compliance stations, S-42 and S-21 during deficiency year.

Figure 1. Suisun Marsh Progressive Mean High Tide Specific Conductance
January 2009



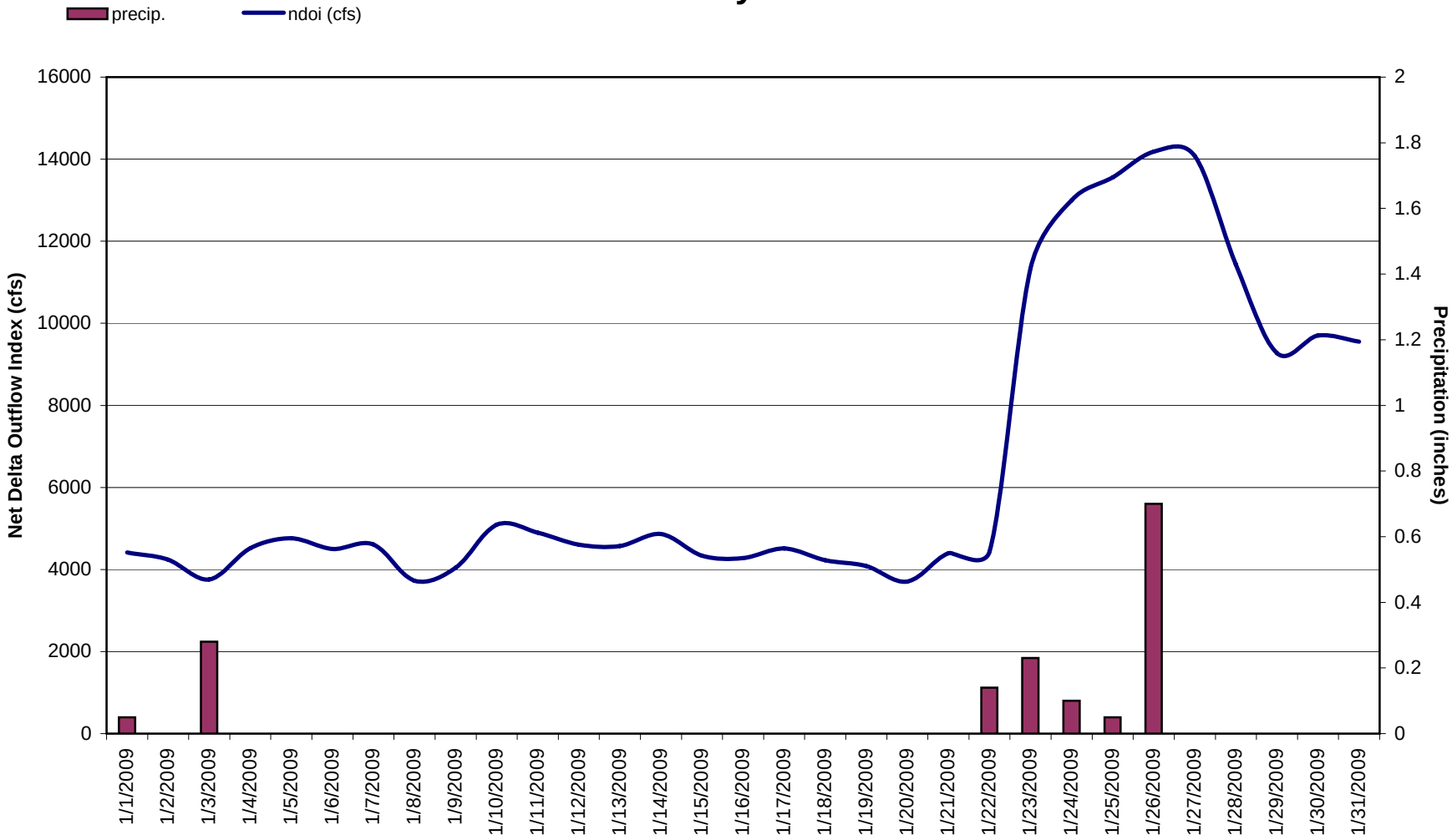
*S64 missing data due to equipment failure.

Figure 2. Suisun Marsh Progressive Mean High Tide Specific Conductance
January 2009



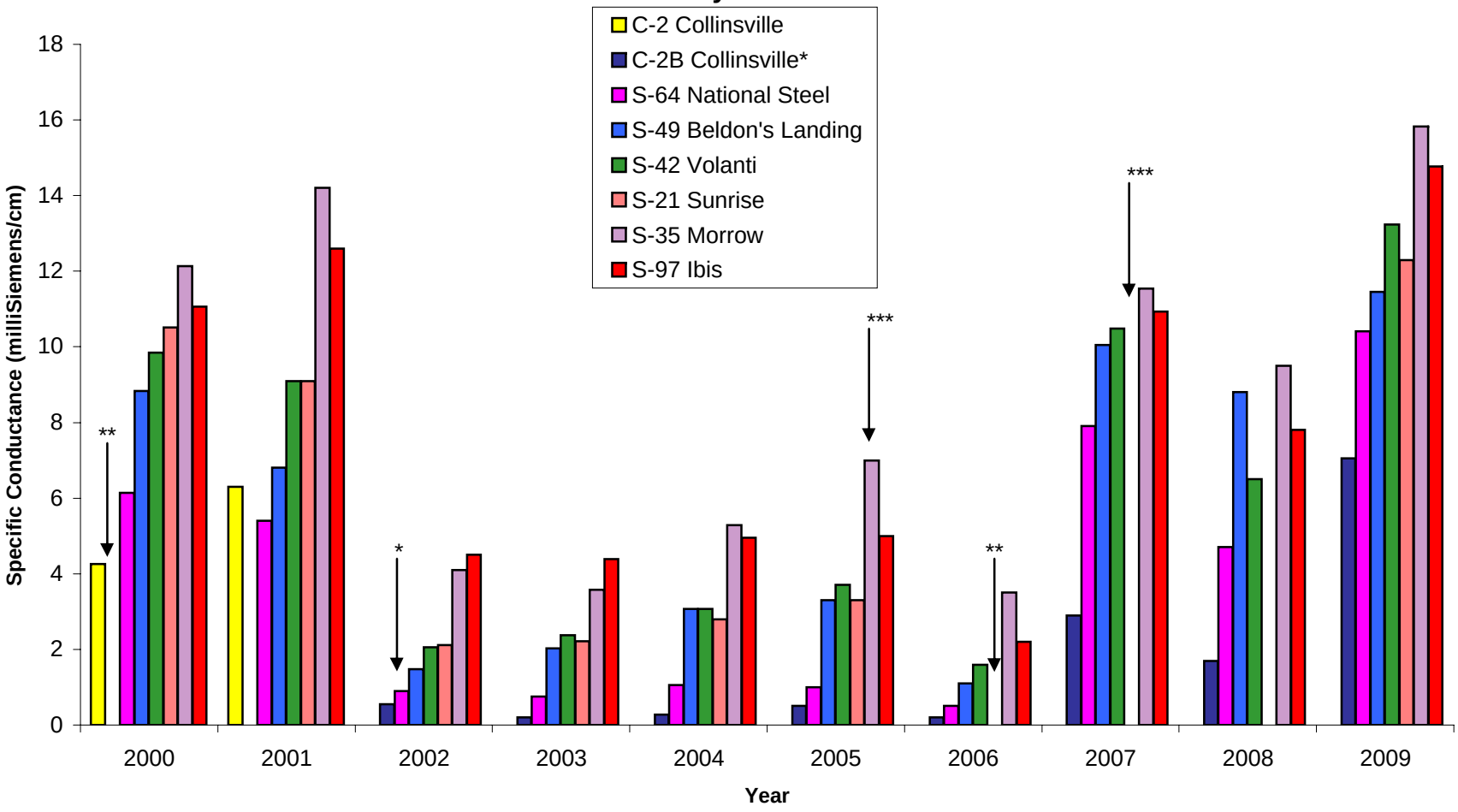
*S97 missing data due to equipment failure.

Figure 3. Daily Net Delta Outflow Index and Precipitation*
January 2009



*Preliminary DWR, O&M Delta Outflow data and precipitation from Fairfield Water Treatment Plant.

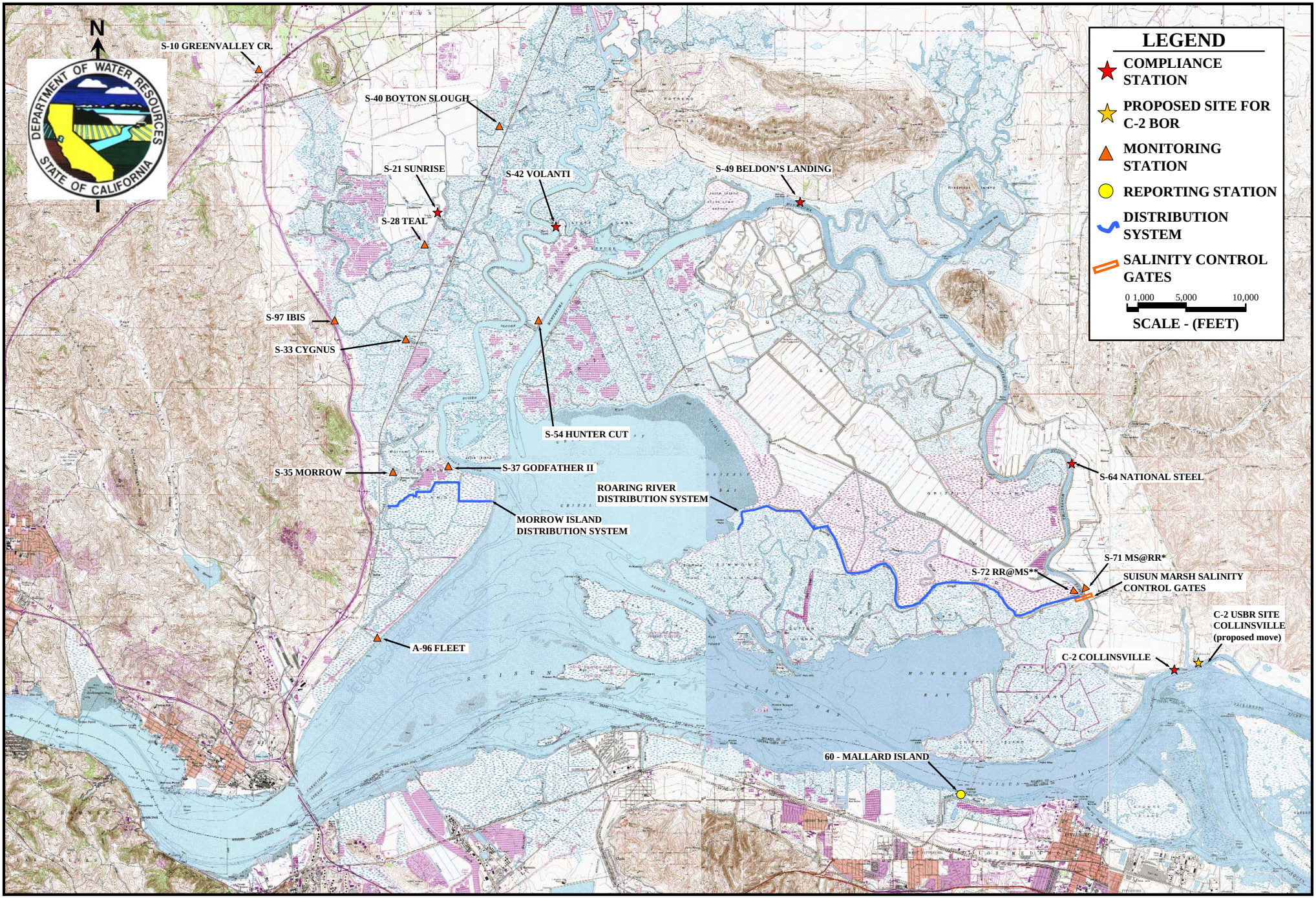
Figure 4. Monthly Mean Specific Conductance at High Tide: Comparison of Monthly Values for Selected Stations January 2000-2009



* = beginning in 2002.

** Data was not obtained due to equipment problem or flood constraint.

***Data not representative of end of month value due to missing data.



SUISUN MARSH PROGRAM WATER QUALITY MONITORING AND CONTROL FACILITIES